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Remarks

Amendments

No amendments have been made.

Claims 1-27 remain in the application. These claims are set forth in Applicants' supplemental response of December 10, 2003.

Examiner's Response to Arguments - Paragraphs 1-2

In paragraph 1 at page 2 of the Final Office action of March 24, 2004 the Examiner indicates that Applicants' arguments of December 10, 2003 were "fully considered but...not persuasive." (The substance of the arguments is actually found in Applicants' original response of November 29, 2003.) In support of this conclusion, the Examiner states his position as follows in paragraph 2 at pages 2-3. (For clarity paragraph 2 has been separated into four separately numbered statements.)

(1) (Claims 1, 2, 21, 22 and 25) Regarding applicant's claim that Kaminov (*sic*) does not teach where an input port of the *frequency router* simultaneously receives at least two optical signals and at least one output port simultaneously presents at least two frequency routed signals.

(2) Apparently, the applicant has interpreted the Kaminov (*sic*) teachings more narrowly than the examiner. Applicant has chosen a router, which is a sub-component of the wavelength/switch router disclosed by Kaminov (*sic*).

(3) However, Kaminov (*sic*) describes the entire apparatus (100 of Figure 1) as a wavelength/router switch (see col. 3, lines 39-41). Again, Kaminov (*sic*) disclosed the wavelength/router switch including an array of N optical signal wavelength-domain or wavelength-sensitive demultiplexers each of which includes an input and s (*sic*) set of F output ports (see col. 1, lines 45-50). So the WDM input ports (101 of figure 1) are input ports to the apparatus or router.

(4) Thus, the apparatus as a whole should be interpreted as the "router" not the component wavelength switches (111 of Figure 1). As such it is clear that input ports 101n (*sic*) and output ports 127n (*sic*) simultaneously receive/present one or more wavelengths. (Emphasis added)

Statements (1) and (2) suggest that Applicants have interpreted Kaminow more narrowly than the Examiner. On the other hand, Applicants' respectfully submit that the Examiner's implicitly broader interpretation set forth in statements (3) and (4) is consistent neither with the technology of such systems nor with Applicants' claims. The key to understanding how

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Applicants' invention, as defined by claims 1, 2, 21, 22 and 25, is patentably distinguishable from Kaminow (as well as the proposed combination of Kaminow and Glance) is to recognize how they are similar and how they are different.

First, in the context of the optical switching systems art, they are similar because Applicants' invention and Kaminow both comprise an overall optical apparatus designated as a **router** that includes a component designated as a **frequency** (or wavelength) router. More specifically, Kaminow identifies his overall router 100 (FIG. 1) as a "wavelength router/switch" (e.g., col. 2, line 47) and identifies his component 202 (FIG. 2) as a "wavelength router" (col. 4, lines 46-48). Likewise, Applicants identify their overall apparatus as a "dynamic optical router" (e.g., claim 1, line 1; FIG. 1, router 10) that includes a component designated as a "frequency router" (e.g., claim 1, line 2; FIG. 1, frequency router 20).

Thus, when comparing Applicants' claim 1, for example, with Kaminow, the logic of this parallelism must be retained so that the examination process does not do a gross injustice to Applicants by distorting how these system configurations are viewed and accepted in the art. That is, Kaminow's router 100 should be compared to Applicants' "dynamic optical router" (e.g., claim 1, line 1) and Kaminow's wavelength router 202 should be compared to Applicants' "frequency router" (e.g., claim 1, lines 2-10).

When this comparison is fairly made, it is clear how Kaminow is different from Applicants' invention. Claim 1, for example, requires that "at least one input port [of the frequency router] simultaneously receives at least two optical signals to be frequency routed" (e.g., FIG. 1, λ_{1a} and λ_{2a} are simultaneously received at input port 22), whereas in Kaminow (and in the Kaminow-Glance combination) wavelength (frequency) router 202 receives only one optical signal at each of its input ports. Likewise, claim 1, for example, requires that "at least one output port [of the frequency router] simultaneously presents at least two frequency routed optical signals" (e.g., FIG. 1, λ_{1a} and λ_{2b} are simultaneously presented at output port 26), whereas in Kaminow (and in the Kaminow-Glance combination) wavelength (frequency) router 202 each output port 113 presents only one optical signal.

Simply put, Kaminow (and the Kaminow-Glance combination) does not teach one skilled in the art that a **frequency** router embedded in a larger routing/switching apparatus has the simultaneous signal features of, for example, claim 1 and accordingly does not provide the public with Applicants' significant contribution to this art - a topology that enables the realization of large scale optical routers.

The foregoing arguments apply equally to claims 2, 21, 22 and 25. In addition, however, claim 2 requires a plurality of combiners (e.g., FIG. 2, PCs 118) that operate on "the at least two optical signals." The antecedent for these signals is, of course, the simultaneously received signals discussed above with regard to claim 1. An embedded frequency router with these types of signals received is neither taught nor reasonably suggested by Kaminow (and the Kaminow-Glance combination), and consequently it must follow that the combiner of Kaminow (e.g., FIG.

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2, combiner 203) does correspond to that set forth in claim 2, lines 2-3. Similar comments apply to the "plurality of receivers" limitation of claim 2, lines 4-6.

Examiner's Response to Arguments - Paragraph 3

In paragraph 3 of the Final Office action, the Examiner makes the following assertion regarding claim 4, which depends from claim 2:

Regarding applicant's (*sic*) claim that the converter/combiner coupling limitation of claim 4 is not reasonably suggested by the cited prior art. Figure 2 of Kaminov (*sic*) is very explicit in showing wavelength converters (201) coupled to Combiners (203). (emphasis added)

This rejection is respectfully traversed for two reasons.

First, since claim 4 depends from claim 2, Applicants traverse for the reasons set forth above regarding claim 2 and incorporated herein by reference.

Second, the Examiner cannot have it both ways. If the Examiner insists that Kaminow's wavelength/frequency router constitutes the overall apparatus 100, then the simultaneous signals to this router would be designated 101_N according to the Examiner's analysis. But no combiners exist at these inputs. That is, the combiners of Applicants' claims 2 & 4 impliedly precede the frequency router inasmuch as the combiners serve to combine the signals and apply the desired simultaneous signals to the frequency router's input ports (e.g., in Applicants' FIG. 3, PC 118₁ combines inputs 102_{1-M} and applies them simultaneously to input port 130₁ of frequency router AWG 120).

Third, if the Examiner insists that the relevant combiners are those designated 203 in Kaminow's FIG. 2, then he is *per force* agreeing with Applicants that the relevant frequency router to which Applicants' claims are to be compared is that designated 202, not the overall apparatus 100.

Examiner's Response to Arguments - Paragraph 6

As applied to claim 5, the Examiner's comments in this paragraph are very confusing. First, the Examiner purports to suggest that Applicants made a "teaching away" argument with respect to the proposed use of Brock's splitters to modify the combination of Kaminow and Glance. Applicant did not. As clearly stated at page 21, 4th paragraph of Applicants' response of November 29, 2003, Applicants in fact argued the principle of "teaching away" only as it applied to claims 6 and 9. But, since the Examiner has indicated that claim 6 is allowable and that claim 9 is allowed, this issue has been rendered moot.

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Claim Rejections – 35 USC §103

At pages 3-6 of the Final Office action the Examiner repeats the Section 103 rejection of claims 1-5 and 21-27 that he set forth in the first Office action of September 10, 2003. In the interests of brevity, Applicants traverse this final rejection for the reasons set forth in their response of November 29, 2003, which is incorporated herein by reference.

In addition, the Examiner has made several new statements, which were not a part of the first Office action and which Applicants traverse as indicated below; to wit, at page 4, paragraph 2, of the Final Office action, in the discussion of claims 1, 3, 22, 24, 25 and 27, the Examiner concludes incorrectly as follows. (For clarity the quoted portion of paragraph 2 has been separated into two separately numbered statements.)

- (1) Furthermore, the Glance router uses wavelength information to route to a destination, the Kaminov (*sic*) signal will *in fact* comprise destination information if using the Glance routing method *by definition* since the destination information is ‘encoded’ in the wavelength. (Emphasis added)
- (2) Finally, Glance disclosed a fast-tunable optical filter, which is used to route signals or ‘dynamically tune to a particular color’ (see col. 2/30-35).

Although Glance indicates that “packets are routed by the frequency router according to their wavelengths, with each source using a different wavelength to access a given destination,” (col. 2, lines 44-46), Glance does not teach or reasonably suggest that either (i) “each optical signal contains destination information”, as required, for example, by claim 1, line 4; or (ii) “each optical signal to be frequency routed is *dynamically* tuned to a particular color in response to its destination information.” From a technology standpoint Applicants’ invention employs *dynamic* tuning, whereas Glance does not. More specifically, Applicants’ invention utilizes preexisting destination information in *each packet* to choose a wavelength that will route each signal to its particular destination properly. Unlike Glance, the wavelength of each of Applicants’ signals is not itself the destination information but is derived from the destination information contained in each packet for the purposes of routing that packet.

Secondly, contrary to the Examiner’s assertion, the optical filters 3 of Glance are not used to either route signals or dynamically tune them. Rather, each filter 3 “detects incoming packets and selects one of them when more than one packet tries to reach the same destination” (col. 2, lines 55-57). The other packets are blocked. This function does not constitute routing or tuning as those terms are used in the optical systems art.

Allowable Subject Matter

Once again Applicants acknowledge and gratefully appreciate that the Examiner has allowed claims 9-20 and, in addition, has indicated that claims 6-8 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

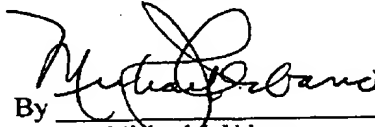
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Conclusion

In view of the foregoing, reconsideration of claims 1-5 and 21-27, and passage of this application to issue, are hereby respectfully requested. If during the consideration of this paper, the Commissioner believes that resolution of the issues raised will be facilitated by further discussion, he is urged to contact the undersigned attorney at 610-691-7710 (voice) or 610-691-8434 (fax).

Respectfully,

Jurgen Gripp
Martin Zirngibl

By 
Michael J. Urbano
Attorney for Applicant(s)
Reg. No. 24, 522
610-691-7710

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